

Map Unit Properties Table

Age	Map Unit Symbol	Features and Description	Erosion Resistance	Suitability for Development	Hazards	Paleontologic Resources	Cultural Resources	Mineral Occurrence	Recreational Uses	Global Significance
QUATERNARY	Soil, talus & slope wash (Qcl); sand & gravel in stream beds (Qal); sand & gravel (Qg); landslide (Qls); Red Bluff Fm. (Qrb)	Unconsolidated soils, talus and other unsorted slope deposits, sand and gravel in rivers and terraces, landslide deposits, and slope wash. Red Bluff Formation consists of sand, gravel and other older unconsolidated deposits.	Very low	Suitable for most forms of development, unstable on slopes and highly permeable	Slumps, slides, rockfalls if exposed on slope	Modern remains possible	Historical structures and artifacts	Sand, gravel, silt, and clay	Good for trails, picnic areas & campsites; mountain biking	Records geomorphologic processes active today
CRETACEOUS	Chico Formation (Kc)	Conglomerate, shale, and sandstone beds; outcrops only locally.	Moderate to high	Suitable for most forms of development unless highly fractured	Block falls and rock falls if undercut	Loose cementation renders fossils unlikely	Possible tool material and campsites	Flagstones	Good for trails and campsites	Cretaceous sedimentary rocks record tectonic setting
JURASSIC OR CRETACEOUS	Birdseye Porphyry (bp); Hornblendite (hb); Quartz Porphyry (qp); Andesite Porphyry (ap); Felsic dike rocks (ad); Metagabbro (mg); Lamprophyre (lp)	Include diorite porphyry, dacite porphyry, andesite porphyry; hornblendite & quartz porphyry present as small pods in outcrop; felsic dikes include aplite appearing as vertical and inclined bodies related to biotite-quartz diorite; metagabbro and lamprophyre outcrop as dikes and irregular bodies; some are associated with Copley Greenstone and most occur only locally, as small irregular bodies and dikes.	Moderate to high	Suitable for development; only very local occurrence	Slides and rockfalls if exposed on steep slopes	None	Irregular deposits rich in minerals; hornblendite; lamprophyre	None documented	Occurs locally	Interesting igneous and metamorphic rocks clustered in one area
JURASSIC OR CRETACEOUS	Biotite hornblende granodiorite (bhgd) and quartz diorite (bqbd, bqdi)	Batholith dated at 128 Ma and is of irregular thickness; largely composed of very biotite rich biotite-hornblende granodiorite and quartz diorite with some associated gneiss and amphibolite; quartz diorite about 40% hornblende and biotite. Gneiss and amphibolite derived from Copley, Balaklala and Bragdon formations; injected rocks and chaotic breccias occur locally and peridotite (silica poor, containing olivine) also occurs locally. Sharp contacts with Copley Greenstone.	Low to moderate (biotite-rich portions are less resistant)	Biotite-rich layers should be avoided due to preferential weathering and slope stability problems; sloughing common in this unit.	Sloughing, rockfalls, block falls, slumping and other slope processes	None	Large biotite crystals; injection breccias; peridotite, olivine crystals	None documented	Climbing should be discouraged; 4WD vehicle use; trails	Intrusive event records mountain building; contact metamorphism available for study
JURASSIC OR CRETACEOUS	Gneiss and amphibolite (gn)									
JURASSIC OR CRETACEOUS	Injected rocks and breccia (in)									
JURASSIC OR CRETACEOUS	Peridotite (p)									
Shasta Bally Batholith (bpd)		Upper Unit (Mbu)		Contacts rich in gold and precious metals; deposits mostly along faults and joints		Good for most recreation; climbing should be discouraged; mine safety hazard		Part of accreted terrane added to the western margin of North America		
Bragdon Formation		Lower Unit (Mbl)		Slides and rockfalls if exposed on steep slopes		Fossils probable in shale beds		Historic mining		
MISSISSIPPIAN		Shale and siltstone (Mbds)		Suitable for most forms of development unless highly fractured		Fossils probable in shale beds		Historic mining		
Phyllite Mbp)		Conglomerate bed (Mbc)		Moderate to high						
Black siliceous shale (Mbdc)										

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DEVONIAN	Trondjemite (tag)	Dated at approximately 400 Ma on the basis of U-Pb dating and cross-cutting relationships with Bragdon Formation and Shasta Bally Batholith; stock is largely homogenous composed of light-colored sodium-rich granite with some siliceous rich portions and some intrusive breccia and diabase present as dikes.		Avoid mica-rich layers which tend to weather as planes of weakness; avoid permeable fractures.	Moderate	Slides and rockfalls if exposed on steep slopes; biotite-rich layers might weather preferentially	None	Historic mining	E-W trending veins rich in gold & other precious metals; Granite; large mica crystals	Good for most recreation including trails; mine safety hazard	Intrusive rock records plutonism
DEVONIAN	Siiceous, pseudoporphyritic albite granite (agi)										
DEVONIAN	Intrusive breccia (br)										
DEVONIAN	Diabase (db)	0-122 m (0-400 ft) thick; outcrops locally outside park boundary; formation contains gray and black cherty shale, most siliceous in composition with limestone dominating the upper beds and tuffaceous (volcanic deposits) sedimentary rocks comprising the lower beds in the formation; some corals, brachiopods in the upper limestone beds.		Suitable for most forms of development unless highly fractured or dissolved	Moderate to high	Slides and rockfalls if exposed on steep slopes	Some corals and brachiopod fossils in limestone beds	None documented	Flagstone	Good for most recreation	Part of accreted terrane added on to the western margin of North America
DEVONIAN	Limestone (Dkl)	0-128 m (0-3700 ft) thick; light-colored generally with flows, pyroclastics and other deposits; porphyritic rhyolite is composed of quartz keratophyre with quartz phenocrysts ranging in size from larger than 4 mm (coarse) to 1-4 mm (medium); rhyolite with quartz keratophyre and quartz phenocrysts smaller than 1 mm are mapped as nonporphyritic rhyolite.		Unit can be preferentially weathered creating stability problems; suitable for most forms of development unless highly fractured.	Moderate to high	Slides and rockfalls if exposed on steep slopes	NW-trending structures host gold and other precious metals; quartz phenocrysts	Historic mining			
DEVONIAN	Tuffaceous sedimentary rock (Dkt)	Volcanic breccia (Dbp)	Balaklala Rhyolite								
DEVONIAN	Porphyritic rhyolite (Dbc, Dbm)	Tuff and tuffaceous sedimentary rock (Dbt)	Kennett Fm.								
DEVONIAN	Nonporphyritic rhyolite (Db)	Greenstone (Dbg)	Multiple Mountain Stock								
PRE-SILURIAN	Pyroclastic rock (Dcp)	Keratophyre, spilite and meta-andesite (Dc)	Copoly Greenstone								
PRE-SILURIAN	Tuff, shaly tuff and shale (Dct)	Unit is at least 1128 m (3700 ft) thick. Keratophyre, spilite and meta-andesite includes some volcanic breccia and agglomerate facies rocks. Volcanic pyroclastic deposits are abundant in this unit. Below these are layers of tuff, shaly tuff and shale, with some sandstone beds further down the column. Greenstone tuff and breccia, and rhyolite tuff are interfingered with gneiss, migmatite, amphibolite and other metamorphic rocks. Unit intertongues with overlying Balaklala Rhyolite.									
PRE-SILURIAN	Shale, shaly tuff and sandstone (Dcs)										
PRE-SILURIAN	Abrams mica schist and Salmon (?) hornblende schist, undifferentiated (Sch)	Abrams mica schist and Salmon (?) hornblende schist are undifferentiated in the map area.									